



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/825,452	04/02/2001	Michael Mermelstein	12325-002001	1325

7590 05/20/2002

CHARLES HIEKEN
Fish & Richardson P.C.
225 Franklin Street
Boston, MA 02110-2804

EXAMINER

CHOI, WILLIAM C

ART UNIT

PAPER NUMBER

2873

DATE MAILED: 05/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/825,452

Applicant(s)

MERMELSTEIN ET AL.

Examiner

William C. Choi

Art Unit

2873

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6,9-11,14-17 and 21-22 is/are rejected.
- 7) ☒ Claim(s) 7,8,12,13,18-20 and 23-30 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 April 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☒ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____

DETAILED ACTION

Oath/Declaration

The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because it states "original first and sole inventor" and more than one inventor is named.

Drawings

This application has been filed with informal drawings, which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

The drawings are objected to because the "Brief Description of the Drawings" references a "Fig. 8a" but no Fig 8a is provided.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.



Claims 1-6, 9-11, 14-17 and 21-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Inagaki et al.

Regarding claim 1, Inagaki et al discloses a method for spatially modulating radiation (Abstract, Figure 3) comprising: directing at least one radiation beam (column 5, lines 51-53 and column 7, lines 31-41, Figure 3, "L") upon at least one surface acoustic wave diffractive element (column 7, lines 33-36, Figure 3, "38"); and driving at least one of said surface acoustic diffractive elements with a plurality of modulating signals (column 7, line 55 – column 8, line 14, Figure 3, "37") to generate a plurality of independently modulated output radiation beams having parameters (column 7, line 55 – column 8, line 14, Figure 3, "L1", "L2" and "L3").

Regarding claim 2, Inagaki et al further discloses the modulating signals being electrical (column 7, lines 55-56, Figure 3, "37").

Regarding claim 3, Inagaki et al discloses the driving comprising modulating at least one output radiation beam parameter selected from the group consisting of the direction (column 7, lines 36-41, Figure 3), the amplitude, phase, and frequency of the modulated output radiation beams.

Regarding claim 4, Inagaki et al discloses the driving comprising the application of a plurality of separate modulating signals for each surface acoustic wave diffractive element (column 7, lines 55-57).

Regarding claim 5, Inagaki et al discloses at least one of the modulating signals being characterized by a plurality of frequencies (column 7, lines 55-57).



Regarding claim 6, Inagaki et al discloses a laser directing the radiation beam (column 5, lines 51-53 and column 7, lines 31-41).

Regarding claim 9, Inagaki et al discloses the modulated output radiation beams directed upon photosensitive material (column 9, lines 39-54, Figure 5, "8").

Regarding claim 10, Inagaki et al discloses an apparatus for spatially modulating radiation (Abstract, Figure 3) comprising: at least one surface acoustic wave diffractive element (Figure 3, "3"), each element inherently having a surface, at least one transducer of surface acoustic waves (column 7, line 57, Figure 3, "33"), a source of a plurality of modulating signals driving the at least one transducer to transduce a surface acoustic wave in the surface of at least one of said surface acoustic wave diffractive elements (column 7, lines 24-30 and line 55 – column 8, line 14, Figure 3, "37"), a source of at least one input radiation beam constructed and arranged so that at least a portion of the input radiation beam strikes a surface acoustic wave diffractive element from outside the surface of that surface acoustic wave diffractive element (column 7, lines 31-41, Figure 3, "L"), and a plurality of modulated output radiation beams modulated by respective ones of said modulating signals (column 7, lines 43-59, Figure 3, "L1", "L2" and "L3").

Regarding claim 11, Inagaki et al discloses the source of radiation being a laser (column 7, lines 31-33), which would inherently have a cavity.

Regarding claim 14, Inagaki et al discloses at least one surface acoustic wave diffractive element having an active area (column 7, lines 24-30, Figure 1, "32").

Regarding claim 15, Inagaki et al discloses the active area being piezoelectric (column 6, line 66 – column 7, line 8, Figure 1, "32").

Regarding claim 16, said active area of Inagaki et al would inherently have a reflectivity greater than zero, this being reasonably based upon Inagaki et al disclosing the input laser beam being deflected (column 7, lines 31-41).

Regarding claim 17, said active area of Inagaki et al would inherently have a transmissivity greater than zero, this being reasonably based upon the indicated piezoelectric materials (column 7, line 7) having well-known transmissive characteristics as well as Inagaki et al disclosing the transmitted beam "Lo" (Figure 3).

Regarding claims 21 and 22, Inagaki et al discloses the transducer comprising interdigital electrodes (column 7, lines 9-13, Figure 3, "33") deposited on top of a piezoelectric substrate (column 6, line 66 – column 7, line 8, Figure 1, "32") and being regularly spaced (Figure 3, "33").

Examiner's Comment

For applicant's information, on page 15, last line of the page, the examiner informally deleted "10. Apparatus for spatially modulating radiation comprising:" since this is a repeat of what is set forth on page 16 in which claim 10 is set forth in its entirety.

Allowable Subject Matter

Claims 7-8, 12-13, 18-20 and 23-30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: in reference to the allowable claims, none of the prior art either alone or in combination disclose or teach of the claimed limitations to warrant a rejection under 35 USC 102 or 103.

The prior art fails to teach a combination of all the claimed features as presented in claim 7-8: a method for spatially modulating radiation comprising: directing at least one radiation beam upon at least one surface acoustic wave diffractive element; and driving at least one of said surface acoustic diffractive elements as claimed and specifically further wherein the radiation beam directing is with a pulsed radiation beam.

The prior art fails to teach a combination of all the claimed features as presented in claims 12-13, 18-20 and 26-29: an apparatus for spatially modulating radiation comprising: at least one surface acoustic wave diffractive element as claimed, a source of a plurality of modulating signals driving the at least one transducer as claimed, a source of at least one input radiation beam as claimed and a plurality of modulated output radiation beams as claimed wherein at least one surface acoustic wave diffractive element has an active area and specifically further wherein: the surface acoustic wave diffractive elements are positioned inside the laser cavity; or said active area is patterned; or on a curved surface; or comprises multiple regions with different

Art Unit: 2873

material; or further comprises a second transducer; or further comprises a second surface acoustic wave diffractive element.

The prior art fails to teach a combination of all the claimed features as presented in claim 23: an apparatus for spatially modulating radiation comprising: at least one surface acoustic wave diffractive element as claimed, a source of a plurality of modulating signals driving the at least one transducer as claimed, a source of at least one input radiation beam as claimed and a plurality of modulated output radiation beams as claimed wherein at least one surface acoustic wave diffractive element has an active area and wherein the transducer comprises interdigital electrodes deposited and irregularly spaced on top of a piezoelectric substrate.

The prior art fails to teach a combination of all the claimed features as presented in claims 24-25 and 30: an apparatus for spatially modulating radiation comprising: at least one surface acoustic wave diffractive element as claimed, a source of a plurality of modulating signals driving the at least one transducer as claimed, a source of at least one input radiation beam as claimed and a plurality of modulated output radiation beams as claimed and specifically further wherein the at least one surface acoustic wave diffractive element includes at least one transducer to create surface acoustic waves in a plurality of adjacent active areas; or wherein the source of modulating signals provides radio frequency electrical signals.

Prior Art Citations

Hatori and Berg et al are being cited herein to embody many of the above indicated specifications in regards to materials, temperatures and processes with the exception of specific details that would warrant a rejection under 35 USC 102 or 103.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Choi whose telephone number is (703) 305-3100. The examiner can normally be reached on Monday-Friday from about 9:00 am to 6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Y. Epps can be reached on (703) 308-4883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3431 for regular communications and (703) 305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Application/Control Number: 09/825,452

Page 9

Art Unit: 2873

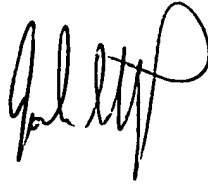
W. C. .

William Choi

Patent Examiner

Art Unit 2873

May 16, 2002

A handwritten signature in black ink, appearing to read 'Jordan Schwartz', with a large, stylized loop at the end.

**JORDAN SCHWARTZ
PRIMARY EXAMINER**